In a previous communication (4), the author reported the presence of three major electrophoretic components in reduced κ-caseins obtained from milks of individual cows by the urea-sulfuric acid method (5). Subsequent to that, Neelin (2) and Schmidt (3) reported the finding of but two major components for κ-casein following the reduction of whole caseins. Similarly, Aschaffenburg (1) observed only two components after examination of a large number of samples. These reports prompted a reexamination of our κ-casein preparations. The κ-casein types reported (4) were based on polyacrylamide gel patterns of reduced κ-casein preparations comparable to those shown in Figure 1. Patterns 2, 3, and 4 are equivalent to the

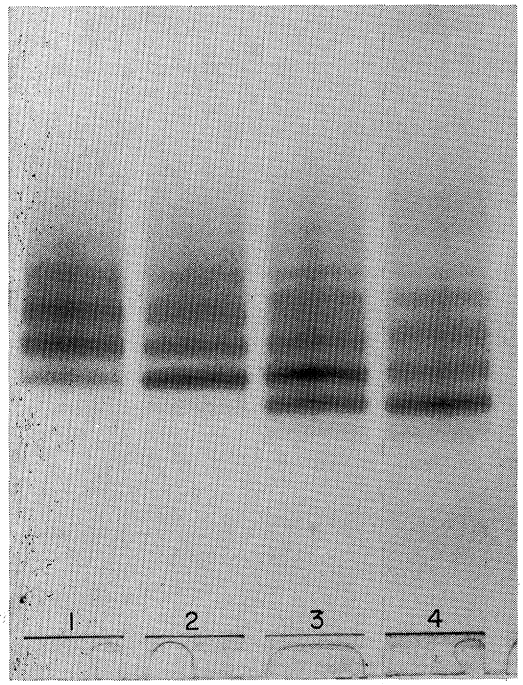

FIG. 1. Polyacrylamide gel electrophoresis of reduced urea-sulfuric acid preparations of individual κ-caseins, pH 9.2 Tris—4.5 M urea and 7% cyanogum.

a, ab, and b κ-casein types reported by Neelin (2). Therefore, the question arose as to whether the qualitative differences in component distribution evident in Pattern 1 could be attributed to a distinct pattern type or to some modification of one of the three other patterns shown in the figure. Examination of the nine individual κ-casein preparations that had given Pattern 1 confirmed the gel pattern shown in Figure 1. However, reduction of the whole caseins obtained from different samples of milks from the same nine cows indicated in each case a κ-casein identical with the type shown in Pattern 2. These results indicated that an alteration of protein components had occurred during the isolation of these nine κ-casein and resulted in a modified electrophoretic pattern. Thus, only three types of κ-casein electrophoretic patterns (2, 3, and 4) have been found for the individual milks examined, and those κ-casein samples previously typed as Type I should be included in the Type II column in the table of reference (4).

The possibility arose that the modification observed could be attributed to a deleterious effect of the acid used in the isolation of κ-casein. In the urea-sulfuric acid method (5) the proteins are normally exposed to a pH in the range 1.3 to 1.5 for several hours. However, exposure of κ-casein to acid (pH 1.3) for 36 hr did not result in a detectable modification of the electrophoretic pattern. This suggests that the alteration of κ-casein occurred not as a result of the acid conditions in the preparative method but to the action of an unknown factor in the time between milking and final isolation of the protein. The electrophoretic differences observed between Patterns 1 and 2 may be the result of changes in the dye-binding capacity of the components or to a degradation of the major component, brought about either by bacterial contamination or by a milk protease.

The κ-casein types of approximately 100 cows were determined first from the electrophoretic patterns of the reduced whole caseins, and secondly from the patterns of the reduced urea-sulfuric acid preparations. Identical κ-casein types were obtained in both cases; no modified electrophoretic patterns similar to 1, Figure 1, were observed. Only two major κ-casein components were found. Therefore, the designation of κ-casein types as a, ab, or b (2) is used in Table 1, which shows the type distribution among different breeds. The corrected distributions of the previous report (4) have been incorporated into the data.

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TABLE 1

Occurrence of Various κ-casein types in different breeds

Breed	Tpye		
	a	ab	b
Holstein	99	36	3
Guernsey	26	17	4
Brown Swiss	9	19	5
Jersey	0	10	38
Ayrshire	1	2	
Totals	135	84	50

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